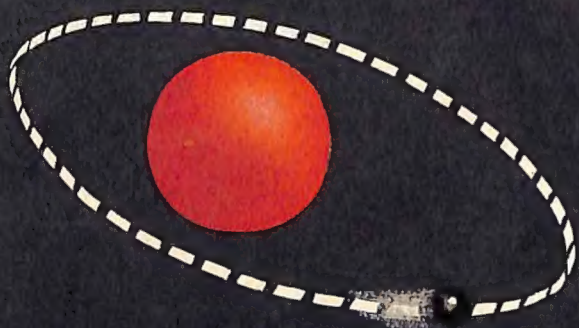


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READ ABOUT SCIENCE 2

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ATOMS





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ATOMS



This man is an atomic scientist.
He works in a laboratory, and tries
to find out all he can about atoms.

Everything is made of atoms—the
air we breathe, the water we drink,
the food we eat, the things we use.

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Atoms cannot be seen even with the most powerful microscope. If a hundred million atoms could be put in a straight line it would be only about an inch long!

Because atoms are so small it has taken scientists many, many years to find out what they are like, and how they are made.

There are over a hundred different kinds of atoms. Here is one of the simplest kinds. It is called an atom of *hydrogen*. Hydrogen is a gas we cannot see, but it is part of the air we breathe.



This atom is made of two parts.
The centre part is called the *nucleus*.
The tiny part moving round it is
called an *electron*.

The electron is always moving round the nucleus, rather like the way the planet Earth moves round the Sun. The whole atom is held together by electricity.

Other atoms have different numbers of electrons moving round their centre parts. Here is one.

This is an atom of iron. The nucleus has twenty-six tiny electrons moving round it at a very high speed.

The nucleus of this atom is much more complicated than the nucleus of the hydrogen atom.

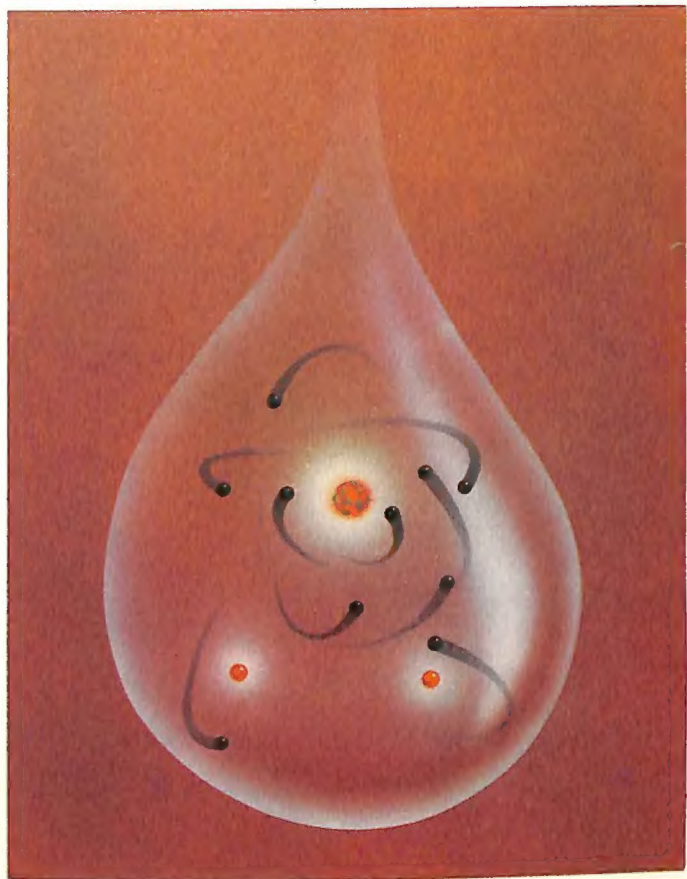


Everything is made of atoms, or groups of atoms. A group of atoms joined together is called a *molecule*.

Here is a molecule of water. It is made of two atoms of hydrogen and one atom of oxygen. The atom of oxygen has eight tiny electrons moving round the nucleus.

Oxygen and hydrogen are gases and, when the right amounts are mixed, they produce water.

All the water you drink is made of molecules like this. There are millions in every drop of water.



Just as a torch sends out a ray of light, so some atoms send out rays of tiny particles. These atoms are called *radio-active* atoms. The rays are used a lot in hospitals and often help to cure people who are ill.

Atoms can also be made to send out rays called *X-rays*. These X-rays can go right through the soft parts of our bodies and cast shadows of our bones.

In this way, doctors can get X-ray pictures of our bones to see if they are broken. Here is an X-ray picture of a person's hand.



The person being X-rayed feels nothing. He is simply photographed by a large camera.

Don't forget to read the book "The X-ray" by W. H. Röntgen

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There is tremendous power locked away in the nucleus of the atom. This is released when the nucleus is broken up, just like a balloon when it is “popped”.

Scientists now know how to “split” the atom. This means that they know how to break up the nucleus. This is called nuclear *fission*.

We know how to use this power to make electricity, which we then use for heating and lighting our homes.

Here is a big nuclear power station where electricity is produced.



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Most nuclear power stations make power from atoms of uranium.

Uranium, like coal, is mined from out of the ground. But one ton of uranium gives about as much power as 10,000 tons of coal.

Today, all big ships are driven by engines burning coal or oil. At the end of each voyage they must stop to pick up more fuel. Atomic power may one day be used to drive these big ships across the seas.

This submarine is driven by atomic power, and it can go all the way round the world without re-fuelling.



As well as “splitting” the atom to make power, power can be got by sticking atoms together.

This is called nuclear *fusion* because the centre parts of the atoms fuse together. Scientists are now trying to build machines which can do this for them.

Have you ever wondered why the Sun shines? It is because it is very hot. It is a huge ball of hot flames which gets its heat by fusing atoms of hydrogen together. It is nuclear power which makes the stars shine.





In some stars the nuclear power released by the atoms is so great that the star explodes.

Here is a picture of a star after it has exploded. You can see the bits spreading out into space. Luckily there is no danger of our Sun doing this.

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Illustrated by Ric Wylam

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